

INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

25 JAN 2005

Applicant's or agent's file reference X-13980	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US 03/19890	International filing date (day/month/year) 31.07.2003	Priority date (day/month/year) 09.08.2002
International Patent Classification (IPC) or both national classification and IPC C07D409/14		
Applicant ELI LILLY AND COMPANY et al.		



- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 6 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 11.12.2003	Date of completion of this report 20.10.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Wörth, C Telephone No. +49 89 2399-8726 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US 03/19890

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-114 as originally filed

Claims, Numbers

1-23 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.
4. The amendments have resulted in the cancellation of:
- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:
5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

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III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 18-23 with respect to IA

because:

☒ the said international application, or the said claims Nos. 18-23 with respect to IA relate to the following subject matter which does not require an international preliminary examination (specify):

see separate sheet

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos.

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the Standard.

☐ the computer readable form has not been furnished or does not comply with the Standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-23
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-23
Industrial applicability (IA)	Yes: Claims	1-17
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No: PCT/US 03/19890

1. Re Item I (Basis of the opinion)

The following documents (D) are referred to in this communication:

- D1: WO 02 072576 A (LETAVIC MICHAEL ANTHONY ;MCCLURE KIM FRANCIS (US); PFIZER PROD INC) 19 September 2002 (2002-09-19)
D2: WO 96 40143 A (ADAMS JERRY LEROY ;BOEHM JEFFREY CHARLES (US); GALLAGHER TIMOTHY F) 19 December 1996 (1996-12-19)
D3: WO 97 25045 A (SMITHKLINE BEECHAM CORP ;ADAMS JERRY L (US); BOEHM JEFFREY C (US);) 17 July 1997 (1997-07-17)
D4: WO 00 10563 A (SMITHKLINE BEECHAM CORP ;ADAMS JERRY L (US); LEE DENNIS (US)) 2 March 2000 (2000-03-02)
D5: REVESZ L ET AL: 'SAR of 4-Hydroxypiperidine and Hydroxyalkyl Substituted Heterocycles as Novel p38 MAP Kinase Inhibitors' BIOORGANIC & MEDICINAL CHEMISTRY LETTERS, OXFORD, GB, vol. 10, 2000, pages 1261-1264, XP002203507 ISSN: 0960-894X

Document D1 does not contribute prior art within the meaning of Rule 64.1(b) PCT and will not be taken into consideration.

2. Re Item III (Non-establishment of opinion with regard to novelty, inventive step and industrial applicability)

Claims 18-23 relate to subject-matter considered by this Authority to be covered by the provisions of Rule 67.1(iv) PCT. Consequently, no opinion will be formulated with respect to the industrial applicability of the subject-matter of these claims (Article 34(4)(a)(i) PCT).

3. Re Item V (Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement)

3.1 Subject-matter

The present application discloses inhibitors of MAP kinase useful in the treatment of cytokine mediated diseases such as metastasis or rheumatoid arthritis.

The claimed compounds are characterized by

- central heteroaromatic group (defined as W) ortho-substituted with

- benzimidazole of benzothiazole and
- phenyl or thienyl (defined as R_3).

3.2 Novelty

The claimed subject-matter differs from the cited prior art in view of the benzimidazole and benzothiophene part.

The requirements of novelty are fulfilled.

3.3 Inventive step

Documents D2-D4 are considered as **relevant prior art**. These documents disclose inhibitors of MAP kinase, wherein the disclosed compounds are characterized by

- an imidazole or triazole core moiety which is ortho-substituted by
- (an optionally substituted) aromatic group (see definitions of R_4 in documents D2-D4) and
- an N-containing heterocycle (see definitions of R_1 in documents D2-D4).

In view of these documents, the **problem to be solved** can be regarded as the provision of further compounds having the same activity as those of documents D2-D4.

The **solution** to this problem consists in compounds of present formula (I) characterized inter alia by a benzimidazole or benzothiazole group.

The problem is considered as being **solved** at least for some compounds claimed in view of the data given e.g. on page 102.

This solution could in principle considered as involving an inventive step in view of the fact that none of the prior art documents teach the replacement of the N-containing heterocycle at the corresponding position in the molecule (see definitions of R_1 in D2-D4) by a fused heterocyclic ring system such as benzimidazole or benzothiazole **via the carbocyclic part**.

Fused heterocyclic rings are known from the prior art since e.g. documents D2 and D3 define R_1 inter alia as 1-benzimidazolyl or quinazolin-4-yl. However, the

said fused heterocycles are bound via their N-containing ring to the central heteroaromatic group. Accordingly, there is no indication to the man skilled in the art that the presently claimed compounds could be a solution to that the problem given.

However, it is not clear which knowledge is used by that the Applicant to state that that the numerous claimed compounds can be regarded as MAP kinase inhibitors, since only some of that the structural variants claimed have been tested.

Documents D2-D4 can not corroborate that the claimed breath e.g. for part "W" including inter alia fused ring systems (see definition of (X) and R_0/R_1 or R_0-R_3).

The requirements of inventive step are presently not fulfilled.

3.4 Industrial applicability

For the assessment of the present claims 18-23 on the question whether they are industrially applicable, no unified criteria exist in the PCT Contracting States. The patentability can also be dependent upon the formulation of the claims. The EPO, for example, does not recognize as industrially applicable the subject-matter of claims to the use of a compound in medical treatment, but may allow, however, claims to a known compound for first use in medical treatment and the use of such a compound for the manufacture of a medicament for a new medical treatment.